
***Federal Railroad Administration***
***Office of Safety***
***Headquarters Assigned***
***Accident Investigation Report***
***HQ-2008-71***

***Union Pacific Railroad Company (UP)***
***Medford, OK***
***August 29, 2008***

***Note that 49 U.S.C. §20903 provides that no part of an accident or incident report made by the Secretary of Transportation/Federal Railroad Administration under 49 U.S.C. §20902 may be used in a civil action for damages resulting from a matter mentioned in the report.***

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION

# FRA FACTUAL RAILROAD ACCIDENT REPORT

FRA File # HQ-2008-71

| | | |
|---|---|---|
| 1.Name of Railroad Operating Train #1: Union Pacific RR Co. [UP ] | 1a. Alphabetic Code: UP | 1b. Railroad Accident/Incident No.: 0808WH009 |
| 2.Name of Railroad Operating Train #2: N/A | 2a. Alphabetic Code: N/A | 2b. Railroad Accident/Incident No.: N/A |
| 3.Name of Railroad Operating Train #3: N/A | 3a. Alphabetic Code: N/A | 3b. Railroad Accident/Incident No.: N/A |
| 4.Name of Railroad Responsible for Track Maintenance: Union Pacific RR Co. [UP ] | 4a. Alphabetic Code: UP | 4b. Railroad Accident/Incident No.: 0808WH009 |
| 5. U.S. DOT_AAR Grade Crossing Identification Number: 595158F | 6. Date of Accident/Incident: Month 08 Day 29 Year 2008 | 7. Time of Accident/Incident: 09:23:04 ☑ AM ☐ PM |

8. Type of Accident/Indicent *(single entry in code box)*: 1. Derailment; 2. Head on collision; 3. Rear end collision; 4. Side collision; 5. Raking collision; 6. Broken Train collision; 7. Hwy-rail crossing; 8. RR grade crossing; 9. Obstruction; 10. Explosion-detonation; 11. Fire/violent rupture; 12. Other impacts; 13. Other *(describe in narrative)* — Code: 07

| 9. Cars Carrying HAZMAT | 10. HAZMAT Cars Damaged/Derailed | 11. Cars Releasing HAZMAT | 12. People Evacuated | 13. Division |
|---|---|---|---|---|
| 9 | N/A | N/A | 0 | WICHITA |

| 14. Nearest City/Town | 15. Milepost *(to nearest tenth)* | 16. State Abbr | 16. State Code | 17. County |
|---|---|---|---|---|
| MEDFORD | 314.93 | N/A | OK | GRANT |

| 18. Temperature (F) *(specify if minus)* | 19. Visibility *(single entry)* 1. Dawn 2. Day 3.Dusk 4.Dark — Code | 20. Weather (single entry) 1. Clear 2. Cloudy 3. Rain 4. Fog 5.Sleet 6.Snow — Code | 21. Type of Track 1. Main 2. Yard 3. Siding 4. Industry — Code |
|---|---|---|---|
| 89 F | 2 | 2 | 1 |

| 22. Track Name/Number | 23. FRA Track Class (1-9, X) — Code | 24. Annual Track Density *(gross tons in millions)* | 25. Time Table Direction 1. North 2. South 3. East 4. West — Code |
|---|---|---|---|
| SINGLE MAIN TRACK | 3 | 11 | 2 |

## OPERATING TRAIN #1

| 26. Type of Equipment Consist *(single entry)* 1. Freight train 2. Passenger train 3. Commuter train 4. Work train 5. Single car 6. Cut of cars 7. Yard/switching 8. Light loco(s). 9. Maint./inspect.car — A. Spec. MoW Equip. Code | 27. Was Equipment Attended? 1. Yes 2. No — Code | 28. Train Number/Symbol |
|---|---|---|
| 1 | 1 | MWTFW29 |

29. Speed *(recorded speed, if available)* R - Recorded, E - Estimated: 37 MPH — Code: R

30. Trailing Tons *(gross tonnage, excluding power units)*: 7636

31. Method(s) of Operation *(enter code(s) that apply)*: a. ATCS; b. Auto train control; c. Auto train stop; d. Cab; e. Traffic; f. Interlocking; g. Automatic block; h. Current of traffic; i. Time table/train orders; j.Track warrant control; k. Direct traffic control; l.Yard limits; m.Special instructions; n. Other than main track; o. Positive train control; p. Other *(Specify in narrative)*

Code(s): j | N/A | N/A | N/A | N/A

31a. Remotely Controlled Locomotive? 0 = Not a remotely controlled; 1 = Remote control portable; 2 = Remote control tower; 3 = Remote control transmitter - more than one remote control transmitter: 0

| 32. Principal Car/Unit | a. Initial and Number | b. Position in Train | c. Loaded *(yes/no)* |
|---|---|---|---|
| (1) First involved *(derailed, struck, etc)* | UP 9402 | 1 | N/A |
| (2) Causing *(if mechanical cause reported)* | 0 | 0 | N/A |

33. If railroad employee(s) tested for drug/alcohol use, enter the number that were positive in the appropriate box.

| Alcohol | Drugs |
|---|---|
| N/A | N/A |

34. Was this consist transporting passengers? (Y/N): N

| 35. Locomotive Units | a. Head End | Mid Train b. Manual | Mid Train c. Remote | Rear End d. Manual | Rear End c. Remote |
|---|---|---|---|---|---|
| (1) Total in Train | 2 | 0 | 0 | 0 | 0 |
| (2) Total Derailed | 0 | 0 | 0 | 0 | 0 |

| 36. Cars | Loaded a. Freight | Loaded b. Pass. | Empty c. Freight | Empty d. Pass. | e. Caboose |
|---|---|---|---|---|---|
| (1) Total in Equipment Consist | 64 | 0 | 11 | 0 | 0 |
| (2) Total Derailed | 0 | 0 | 0 | 0 | 0 |

37. Equipment Damage — This Consist: $700,000.00

38. Track, Signal, Way, & Structure Damage: $0.00

39. Primary Cause Code: M302

40. Contributing Cause Code: N/A

Number of Crew Members

| 41. Engineer/ Operators | 42. Firemen | 43. Conductors | 44. Brakemen |
|---|---|---|---|
| 1 | 0 | 1 | 0 |

Length of Time on Duty

45. Engineer/Operator: Hrs 5 Mi 23

46. Conductor: Hrs 5 Mi 23

| Casualties to: | 47. Railroad Employees | 48. Train Passengers | 49. Other |
|---|---|---|---|
| Fatal | 2 | 0 | 1 |
| Nonfatal | 0 | 0 | 0 |

50. EOT Device? 1. Yes 2. No: 1

51. Was EOT Device Properly Armed? 1. Yes 2. No: 1

52. Caboose Occupied by Crew? 1. Yes 2. No: N/A

## OPERATING TRAIN #2

| 53. Type of Equipment Consist *(single entry)* 1. Freight train 2. Passenger train 3. Commuter train 4. Work train 5. Single car 6. Cut of cars 7. Yard/switching 8. Light loco(s). 9. Maint./inspect.car — A. Spec. MoW Equip. Code | 54. Was Equipment Attended? 1. Yes 2. No — Code | 55. Train Number/Symbol |
|---|---|---|
| N/A | N/A | N/A |

56. Speed *(recorded speed, if available)* R - Recorded, E - Estimated: N/A MPH — Code: N/A

58. Method(s) of Operation *(enter code(s) that apply)*: a. ATCS; b. Auto train control; g. Automatic block; h. Current of traffic; m.Special instructions; n. Other than main track

58a. Remotely Controlled Locomotive? 0 = Not a remotely controlled; 1 = Remote control portable

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57. Trailing Tons *(gross tonnage, excluding power units)*: N/A

c. Auto train stop; d. Cab; e. Traffic; f. Interlocking; i. Time table/train orders; j.Track warrant control; k. Direct traffic control; l.Yard limits; o. Positive train control; p. Other *(Specify in narrative)*
Code(s): N/A | N/A | N/A | N/A | N/A

2 = Remote control tower
3 = Remote control transmitter - more than one remote control transmitter: N/A

| 59. Principal Car/Unit | a. Initial and Number | b. Position in Train | c. Loaded *(yes/no)* |
|---|---|---|---|
| (1) First involved *(derailed, struck, etc)* | N/A | N/A | N/A |
| (2) Causing *(if mechanical cause reported)* | N/A | N/A | N/A |

60. If railroad employee(s) tested for drug/alcohol use, enter the number that were positive in the appropriate box.

| Alcohol | Drugs |
|---|---|
| N/A | N/A |

61. Was this consist transporting passengers? (Y/N): N/A

| 62. Locomotive Units | a. Head End | Mid Train b. Manual | Mid Train c. Remote | Rear End d. Manual | Rear End c. Remote |
|---|---|---|---|---|---|
| (1) Total in Train | N/A | N/A | N/A | N/A | N/A |
| (2) Total Derailed | N/A | N/A | N/A | N/A | N/A |

| 63. Cars | Loaded a. Freight | Loaded b. Pass. | Empty c. Freight | Empty d. Pass. | e. Caboose |
|---|---|---|---|---|---|
| (1) Total in Equipment Consist | N/A | N/A | N/A | N/A | N/A |
| (2) Total Derailed | N/A | N/A | N/A | N/A | N/A |

64. Equipment Damage This Consist: N/A

65. Track, Signal, Way, & Structure Damage: N/A

66. Primary Cause Code: N/A

67. Contributing Cause Code: N/A

Number of Crew Members

| 68. Engineer/ Operators | 69. Firemen | 70. Conductors | 71. Brakemen |
|---|---|---|---|
| N/A | N/A | N/A | N/A |

Length of Time on Duty

72. Engineer/Operator: Hrs N/A Mi N/A

73. Conductor: Hrs N/A Mi N/A

| Casualties to: | 74. Railroad Employees | 75. Train Passengers | 76. Other |
|---|---|---|---|
| Fatal | N/A | N/A | N/A |
| Nonfatal | N/A | N/A | N/A |

77. EOT Device? 1. Yes 2. No: N/A

78. Was EOT Device Properly Armed? 1. Yes 2. No: N/A

79. Caboose Occupied by Crew? 1. Yes 2. No: N/A

## OPERATING TRAIN #3

80. Type of Equipment Consist *(single entry)*
1. Freight train 2. Passenger train 3. Commuter train 4. Work train 5. Single car 6. Cut of cars 7. Yard/switching 8. Light loco(s). 9. Maint./inspect.car
A. Spec. MoW Equip. Code: 1

81. Was Equipment Attended? 1. Yes 2. No: N/A

82. Train Number/Symbol: N/A

83. Speed *(recorded speed, if available)* Code
R - Recorded
E - Estimated
N/A MPH: 0

84. Trailing Tons *(gross tonnage, excluding power units)*: N/A

85. Method(s) of Operation *(enter code(s) that apply)*
a. ATCS; b. Auto train control; c. Auto train stop; d. Cab; e. Traffic; f. Interlocking; g. Automatic block; h. Current of traffic; i. Time table/train orders; j.Track warrant control; k. Direct traffic control; l.Yard limits; m.Special instructions; n. Other than main track; o. Positive train control; p. Other *(Specify in narrative)*
Code(s): N/A | N/A | N/A | N/A | N/A

85a. Remotely Controlled Locomotive?
0 = Not a remotely controlled
1 = Remote control portable
2 = Remote control tower
3 = Remote control transmitter - more than one remote control transmitter: N/A

| 86. Principal Car/Unit | a. Initial and Number | b. Position in Train | c. Loaded *(yes/no)* |
|---|---|---|---|
| (1) First involved *(derailed, struck, etc)* | 0 | 0 | N/A |
| (2) Causing *(if mechanical cause reported)* | 0 | 0 | N/A |

87. If railroad employee(s) tested for drug/alcohol use, enter the number that were positive in the appropriate box.

| Alcohol | Drugs |
|---|---|
| N/A | N/A |

88. Was this consist transporting passengers? (Y/N): N/A

| 89. Locomotive Units | a. Head End | Mid Train b. Manual | Mid Train c. Remote | Rear End d. Manual | Rear End c. Remote |
|---|---|---|---|---|---|
| (1) Total in Train | 0 | 0 | 0 | 0 | 0 |
| (2) Total Derailed | 0 | 0 | 0 | 0 | 0 |

| 90. Cars | Loaded a. Freight | Loaded b. Pass. | Empty c. Freight | Empty d. Pass. | e. Caboose |
|---|---|---|---|---|---|
| (1) Total in Equipment Consist | 0 | 0 | 0 | 0 | 0 |
| (2) Total Derailed | 0 | 0 | 0 | 0 | 0 |

91. Equipment Damage This Consist: $0.00

92. Track, Signal, Way, & Structure Damage: $0.00

93. Primary Cause Code: N/A

94. Contributing Cause Code: N/A

Number of Crew Members

| 95. Engineer/ Operators | 96. Firemen | 97. Conductors | 98. Brakemen |
|---|---|---|---|
| 0 | 0 | 0 | 0 |

Length of Time on Duty

99. Engineer/Operator: Hrs 0 Mi 0

100. Conductor: Hrs 0 Mi 0

| Casualties to: | 101. Railroad Employees | 102. Train | 103. Other |
|---|---|---|---|
| Fatal | 0 | 0 | 0 |
| Nonfatal | 0 | 0 | 0 |

104. EOT 1. Yes 2. No: N/A

105. Was EOT Device Properly 1. Yes 2. No: N/A

106. Caboose Occupied by Crew? 1. Yes 2. No: N/A

## Highway User Involved

107. Code: C
A. Auto; B. Truck; C. Truck-Trailer.; D. Pick-Up Truck; E. Van; F. Bus; G. School Bus; H. Motorcycle; J. Other Motor Vehicle; K. Pedestrian; M. Other *(spec. in narrative)*

108. Vehicle Speed *(est. MPH at impact)*: 5

109. *geographical)* Code: 4
1.North 2.South 3.East 4.West

## Rail Equipment Involved

111. Equipment Code: 1
1.Train *(units pulling)*; 2.Train *(units pushing)*; 3.Train *(standing)*; 4.Car(s) *(moving)*; 5.Car(s) *(standing)*; 6.Light Loco(s) *(moving)*; 7.Light(s) *(standing)*; 8.Other *(specify in narrative)*

112. Position of Car Unit in: 0

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| 110. Position | Code | 113. Circumstance | Code |
|---|---|---|---|
| 1.Stalled on Crossing 2.Stopped on Crossing 3.Moving Over Crossing 4. Trapped | 3 | 1. Rail Equipment Struck Highway User 2. Rail Equipment Struck by Highway User | 1 |
| 114a. Was the highway user and/or rail equipment involved in the impact transporting hazardous materials? 1. Highway User 2. Rail Equipment 3. Both 4. Neither | 3 | 114b. Was there a hazardous materials release 1. Highway User 2. Rail Equipment 3. Both 4. Neither | 1 |

114c. State here the name and quantity of the hazardous materials released, if any.

LPG, 9377 GALLONS

| 115. Type Crossing Warning | 1.Gates 2.Cantilever FLS 3.Standard FLS | 4.Wig Wags 5.Hwy. traffic signals 6.Audible | 7.Crossbucks 8.Stop signs 9.Watchman | 10.Flagged by crew 11.Other *(spec. in narr.)* 12.None | 116. Signaled Crossing *(See instructions for codes)* | Code | 117. Whistle 1. Yes 2. No 3. Unknown | Code |
|---|---|---|---|---|---|---|---|---|
| Code(s) | 07 | N/A | N/A | N/A | N/A | N/A | | 2 |

| 118. Location of Warning 1. Both Sides 2. Side of Vehicle Approach 3. Opposite Side of Vehicle Approach | Code | 119. Crossing Warning with Highway Signals 1. Yes 2. No 3. Unknown | Code | 120. Crossing Illuminated by Street Lights or Special Lights 1. Yes 2. No 3. Unknown | Code |
|---|---|---|---|---|---|
| | 1 | | 2 | | N/A |

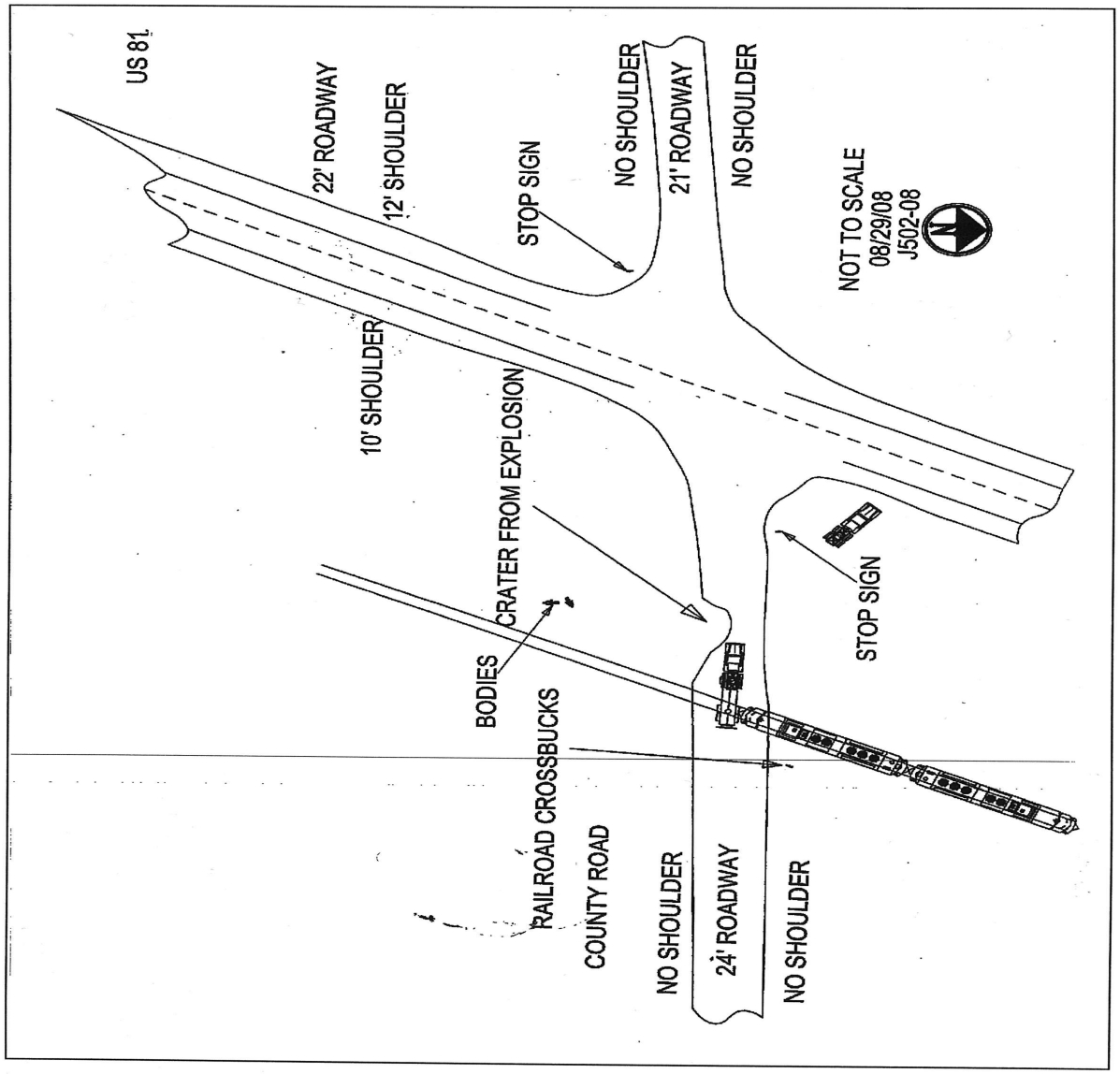
| 121. Age | 122. Driver's Gender 1. Male 2. Female | Code | 123. Driver Drove Behind or in Front of and Struck or was Struck by Second Train 1. Yes 2. No 3. Unknown | Code | 124. Driver 1. Drove around or thru the Gate 2. Stopped and then Proceeded 3. Did not Stop 4. Stopped on Crossing 5. Other *(specify in narrative)* | Code |
|---|---|---|---|---|---|---|
| 52 | | 1 | | 2 | | 3 |

| 125. Driver Passed Highway Vehicle 1. Yes 2. No 3. Unknown | Code | 126. View of Track Obscured by *(primary obstruction)* 1. Permanent Structure 2. Standing Railroad Equipment 3. Passing Train 4. Topography 5. Vegetation 6. Highway Vehicle 7. Other *(specify in narrative)* 8. Not obstructed | Code |
|---|---|---|---|
| | 2 | | 8 |

| Casualties to: | Killed | Injured | 127. Driver 1. Killed 2.Injured 3. Uninjured | Code | 128. Was Driver in the Vehicle? 1. Yes 2. No | Code |
|---|---|---|---|---|---|---|
| | | | | 1 | | 1 |
| 129. Highway-Rail Crossing Users | 1 | 0 | 130. Highway Vehicle Property Damage *(est. dollar damage)* | 300000 | 131. Total Number of Highway-Rail Crossing Users *(include driver)* | 1 |

| 132. Locomotive Auxiliary Lights? 1. Yes 2. No | Code | 133. Locomotive Auxiliary Lights Operational? 1. Yes 2. No | Code |
|---|---|---|---|
| | 1 | | 1 |
| 134. Locomotive Headlight Illuminated? 1. Yes 2. No | Code | 135. Locomotive Audible Warning Sounded? 1. Yes 2. No | Code |
| | 1 | | 1 |

136. DRAW A SKETCH OF ACCIDENT AREA INCLUDING ALL TRACKS, SIGNALS, SWITCHES, STRUCTURES, OBJECTS, ETC., INVOLVED.



137. SYNOPSIS OF THE ACCIDENT

-A southbound Union Pacific Railroad Company (UP) freight train collided with a westbound truck and trailer combination at 9:23 a.m., Central Standard Time (CST), on August 29, 2008. The collision occurred when the driver of the truck and trailer moved over a public grade crossing and into the path of the approaching UP freight train. The collision occurred in Grant County, Oklahoma within the city limits of Medford, Oklahoma at UP Milepost 314.93 on the Enid Sub-Division of the Wichita Service Unit.

The truck and trailer combination (semi-truck) had just departed the Conoco-Phillips propane facility located at the northeast quadrant of the crossing, after loading with 9377 gallons of lIQUID Propane Gas (LPG). Upon impact, the trailer exploded, fatally injuring the driver of the semi-truck as well as both crew members of the freight train, a conductor and engineer. The semi-truck was destroyed as a result of the explosion and the lead locomotive, UP 9402 sustained significant damage. The trailing locomotive, UP 3825 also sustained some damage as did the Conoco-Phillips propane facility. Total damage to railroad equipment was in excess of $700,000 and estimated damage to the semi-truck, including the lading, was estimated at $300,000.

At the time of the accident, it was daylight and cloudy with a temperature of 89° F.

The cause of the accident was driver inattention and failure to yield right-of-way to an oncoming train.

138. NARRATIVE

CIRCUMSTANCES PRIOR TO THE ACCIDENT

UP Train MWTFW-29 originated on August 29, 2008 in Wichita, Kansas (H186) and a Class I air brake test was performed by Union Pacific Railroad (UP) mechanical forces at 4:30 a.m. (CST) on August 29th.

The crew consisted of an engineer and conductor, and went on duty at Wichita, Kansas at 4:00 a.m. The engineer had 22 hours and 20 minutes of rest and the conductor had 22 hours and 5 minutes of rest. They both received the required statutory off duty rest period. At the time of the accident the crew had been on duty for 5 hours and 23 minutes. The positions and actions of the train crew are unknown since there were no survivors or observations from witnesses available.

UP Train MWTFW-29 consisted of 2 locomotives, UP 9402 (lead) and UP 3825 (trail) and 75 freight cars (64 loads and 11 empties) including 9 cars containing hazardous materials. UP Train MWTFW-29 departed Wichita at 6:30 a.m.

The railroad right-of-way at the accident site is a single main tangent track for at least one mile in both directions, with a zero grade and a maximum allowable speed of 40 mph. The County Road involved in the accident goes across the railroad main track at a slight right angle to the southwest. The railroad time table direction of the train is south and the geographical direction of the train is south. Timetable directions are used throughout this report.

HIGHWAY VEHICLE:

The semi-truck was a year model 2005 Sterling model AT9 with a year model 2004 Mississippi Tank Company model MTC LPG transport trailer attached. There was one occupant of the semi-truck, a 52 year old male driver. The Sterling tractor measured 28 feet long and 8 feet wide, the MTC LPG trailer measured 38 feet long and 8 feet wide, when each unit was measured separately. When the tractor and trailer are connected for highway use, the total overall length is 60 feet. The driver's seat measured 66 inches above

ground level and the top of the driver's side headrest measured 92 inches above ground level. At the time of the collision the truck and trailer combination, including the lading, weighed approximately 76,126 lbs.

GRADE CROSSING:

The affected grade crossing located at Grant County Road E1070 DOT Number 595 158 F, is equipped with cross-bucks only. An advance warning sign is present in the direction of travel of the semi-truck and is located 405 feet prior to the grade crossing and 300 feet west of the exit gate used by the driver. There were no pavement warning markings present. County Road E1070 approaches the railroad main track at a slight right angle to the southwest. The surface composition of County Road E1070 is asphalt and as the county road approaches the grade crossing the surface becomes loose rock/asphalt mix. The surface of the grade crossing itself consists of concrete planks. The surface conditions of both the county road and the crossing surface were dry at the time of the accident.

THE GRADE CROSSING:

UP TRAIN UP MWTFW-29:

The train was being operated at 37 mph as it approached the accident area. The train crew's view of the crossing was unobstructed. Both members of the train crew were killed as a result of the collision and resulting explosion, thus it is impossible to determine when the crew became aware of the impending collision. Sometime just prior to the impact the engineer initiated an emergency train air brake application. Train speed was recorded by the event recorder on the trailing locomotive, UP 3825. The maximum authorized speed for this train was 40 mph as designated in the current Union Pacific Railroad Company Timetable No. 3.

HIGHWAY VEHICLE:

The vehicle was traveling West on Grant County Road E1070. According to a witness statement obtained from the Oklahoma State Highway Patrol, the driver approached and occupied the grade crossing without stopping. There was no information available for the estimated speed of the highway vehicle and the posted speed limit for County Road E1070 is 45 mph, according to the Oklahoma Highway Patrol accident report.

The train struck the vehicle trailer at a point approximately midway in between the right rear axle of the Sterling tractor and the unloading valves located on the MTC trailer. This distance is approximately 37 feet from the front of the tractor. As a result of the collision the pressure vessel ruptured and an explosion occurred, destroying the tractor trailer combination and causing substantial damage to the lead locomotive, UP 9402. Lead locomotive UP 9402 and the trailing locomotive, UP 3825, both caught fire. The train continued to travel south until stopping at a point approximately 1479 feet south of the grade crossing proper.

The lone occupant and driver of the highway vehicle traveled south on U.S. highway 81 through the city limits of Medford, Oklahoma and proceeded to turn left (east) onto County Road E0170, otherwise known as Kaw City Road. According to witness statements, the driver then crossed over the affected grade crossing in the eastern direction and entered the Conoco-Phillips propane facility located at the northeast quadrant of the area. The driver entered the facility through the western most entrance gate and proceeded to the loading shed located in the facility proper. After loading the trailer with approximately 9,377 gallons of LPG, the driver entered the Conoco-Phillips yard office and obtained copies of his bill of lading, which he signed at 9:18 a.m. Directly above and to the left of his signature on the bill of lading is a reminder to stop at the railroad crossing. The driver then departed the facility using the eastern most exit gate and proceeded back onto County Road E0170 traveling in a western direction. According to witness statements, as the driver approached the grade crossing at approximately 9:23 a.m., he slowed but did not stop before proceeding across it, and was struck by the southbound freight train which was traveling at a speed of 37 mph according to event recorder data recovered from the trailing locomotive, UP 3825. According to information furnished by the truck owner this was the driver's first trip to the Conoco-Phillips propane facility.

Both members of the train crew were ejected from the cab of the lead locomotive due to the forces involved in connection with the explosion. The train crewmen sustained fatal injuries due to the collision and were found laying on the ground approximately 77 feet from the grade crossing at the southwest quadrant. The train crew was able to make an emergency brake application immediately prior to the collision. T he driver of the

truck sustained major injuries that were fatal. He was airlifted from the scene and transported to Saint Francis hospital in Wichita, Kansas where he expired the following day.

The tank trailer pressure vessel became a projectile due to the explosion with several portions of the vessel landing up to 1/4 mile away from the impact site. The property adjacent to the grade crossing caught fire and the road asphalt and gravel surface of County Road E0170 sustained major damage from the explosion. Nearby power lines and power poles were also damaged by the explosion. One section of the vessel traveled across the Conoco-Phillips tank farm, damaging one outflow valve and some fencing before landing against a warehouse located approximately 785 feet from the grade crossing. The cab of the tractor came to rest at the northwest quadrant of the grade crossing in the upright position with the front of the cab pointing in the northwest direction. The tractor cab point of final rest was in between the railroad right of way and U.S. Highway 81 approximately 99 feet from the point of impact.

Damage sustained to rail equipment was estimated at 700,000.00
Damage sustained to the highway vehicle and lading was estimated at 300,000.00

At approximately 3:30 p.m. UP Train AAMOK-28 arrived at the rear (north) of UP Train MWTFW-29 and took charge of the 75 freight cars, transporting them to Caldwell, Kansas. An extra crew was assigned a single locomotive in Enid, Oklahoma and this train crew arrived at Medford at about this same time and transported the damaged locomotives back to Enid. The main track was opened at 6:30 p.m. and UP Train AAMOK-28 traveled through the area at approximately 7:15 p.m. without incident.

ANALYSIS END CONCLUSIONS

ANALYSIS - TOXICOLOGICAL TESTING:

The driver of the semi-truck was a 52 year old male.
There were no toxicological tests performed on this individual.

The train crew consisted of an engineer, 52 years old and a conductor, 53 years old.
No toxicological tests were performed on these individuals.

ANALYSIS - HIGHWAY-RAIL GRADE CROSSING:

The grade crossing is equipped with cross-bucks only. There is an advance warning sign 405 feet prior to the grade crossing. There were no pavement markings. There were no visual obstruction in view of the driver in either the south or north directions.

The train crew operated the horn prior to the crossing and until the moment of impact, according to witness statements.

There were no active warning devices at the grade crossing so no tests were performed.

ANALYSIS - LOCOMOTIVE SAFETUY DEVICES:

The lead locomotive, UP 9402, was equipped with headlights, auxiliary lights and audible warning devices as required by Federal regulations. The locomotive air horn was working prior to the collision as evidenced numerous witness statements. Due to the severity of damage incurred by the lead locomotive, these safety devices could not be tested and the event recorder data could not be recovered. The data referred to in this report was recovered from the rear unit, UP 3825.

CONCLUSION:

The locomotive safety devices were in compliance with the FRA Regulations.

ANALYSIS - LOMOTIVE ENGINEER OPERATING PERFORMANCE:

The lead locomotive was equipped with a speed indicator and an event recorder as required by Federal regulations. The data was not able to be recovered due to the severity of the damage incurred. Event

recorder data referred to in this report was recovered from the trailing locomotive, UP 3825.

CONCLUSION:

The locomotive engineer was in compliance with all applicable railroad operating and train handling requirements.

ANALYSIS:

FRA obtained fatigue related information, for the 10-day period preceding this incident including the 10-day work history (on duty/off duty cycles) for all of the employees involved.

CONCLUSION:

Upon analysis of that information FRA concluded fatigue was not probable for any of the employees.

PROBABLE CAUSE AND CONTRIBUTING FACTORS:

The accident occurred because the driver of the highway vehicle failed to stop at the highway-rail grade crossing. Federal and State law requires vehicles transporting hazardous materials stop at all railroad crossings. Contributing factors include driver unfamiliarity with the area since it was his first trip to the facility and the southwest right angle approach of the county road to the grade crossing.

Emergency responders to the scene included the Oklahoma Highway Patrol, Grant County Sheriff's Office, Medford, Oklahoma Police Department, Union Pacific Railroad Police, Burlington Northern Santa Fe Railway Police, Grant County Justice of the Peace and Eagle Medical Transport Services.

The cause of the accident was driver inattention and failure to yield the right-of-way to an oncoming train.